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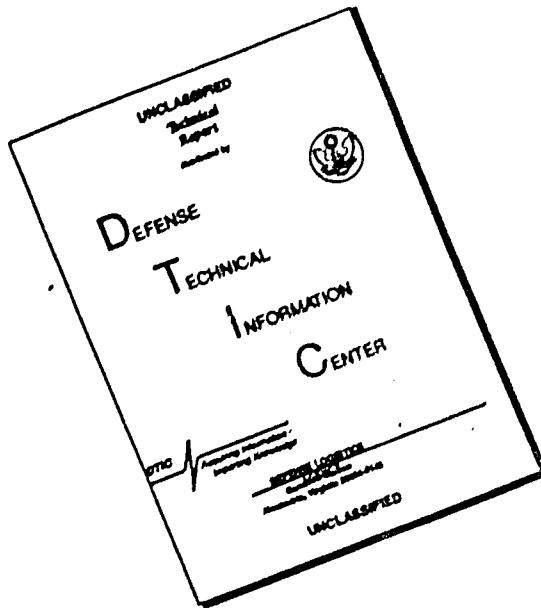
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WASHINGTON, D.C. 20310

(Gr 20) DDCI
REF ID: A6515
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IN REPLY REFER TO

AGDA (M) (22 Jun 70) FOR OT UT 701194

25 June 1970

SUBJECT: Operational Report - Lessons Learned, Headquarters, 159th Engineer Group, Period Ending 31 January 1970

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Kenneth G. Wickham

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DEPARTMENT OF THE ARMY
HEADQUARTERS, 159TH ENGINEER GROUP
APO 96491

EGB-CO

14 February 1970

SUBJECT: Operational Report-Lessons Learned (Headquarters, 159th Engineer Group) Period Ending 31 January 1970 RCS CSFOR-65(R2)

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SECTION I. Operations: Significant Activities

1. COMMAND:

a. Organization:

This report covers the activities of the 159th Engineer Group from 1 November 1969 to 31 January 1970. The Group was commanded by COL Joseph K. Bratton, 472-24-0434, for the entire reporting period. Subordinate units to the 159th Engineer Group are listed below with the arrival and operational dates in this command:

<u>UNIT</u>	<u>ARRIVAL</u>	<u>OPERATIONAL</u>
HHC, 159th Engineer Group	30 October 1965	30 October 1965
34th Engineer Battalion	16 December 1968	16 December 1968
46th Engineer Battalion	25 September 1965	4 October 1965
92nd Engineer Battalion	23 May 1967	30 January 1967
169th Engineer Battalion	30 May 1966	10 June 1966
41st Engineer Company (PC)	1 February 1967	13 February 1967
43rd Engineer Company (DT)	12 September 1966	25 September 1966
103rd Engineer Company (CS)	5 February 1966	5 February 1966
544th Engineer Company (CS)	14 November 1969	1 December 1969
22nd Engineer Detachment (WD)	1 November 1967	20 May 1968
38th Engineer Detachment (WD)	1 August 1968	1 August 1968
143rd Engineer Detachment (CMP)	16 May 1967	1 June 1968
156th Engineer Detachment (WD)	1 August 1968	1 August 1968
551st Engineer Detachment (WD)	21 January 1968	21 January 1968
714th Engineer Detachment (PWR)	1 January 1970	1 January 1970
917th Engineer Detachment (WD)	1 August 1968	1 August 1968

b. Mission: The mission of the 159th Engineer Group is to accomplish engineer construction as directed, to provide combat support as required and to defend approximately three miles of the Long Binh Post perimeter.

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c. AOR: The 159th Engineer Group AOR includes the main political and tactical districts of Saigon, Bien Hoa, Long Binh, Bearcat, Vung Tau, Long Thanh, Xuan Loc, Blackhorse, Phu Loi and all major lines of communication within its borders. The AOR is defined as being all that area bounded by the South China Sea and the following trace from the Song Nha Be (XS 9276) west along the Gia Dinh Province border to the Kinh Xang canal (XS 6389) then north to the Gia Dinh Province border intersection with QL-1 (XT 7107) and west to the Song Saigon (XT 8108); from there along the Song Saigon and Song Thi Tinh north to XT 7723, west to QL-13 (XT 7823) and north along QL-13 to Ben Cat (XT 7433). The trace follows small stream beds northwest of Ben Cat to LTL-1A (XT 9244), then west and south along the Song Be and Song Dong Nai to the Long Khanh province border to the coast (YS 7489).

d. Assignment: The 159th Engineer Group has been assigned to the 20th Engineer Brigade since 5 August 1967. Prior to 5 August 1967, the 159th Engineer Group was assigned directly to the US Army Engineer Command Vietnam (Provisional), USAECAV(P). The group headquarters is located at Long Binh, RVN.

e. Movements, Attachments, and Detachments: The group and battalion headquarters remained unchanged during the reporting period. A significant number of company and platoon sized moves in support of the FY 70 LOC upgrade program were made. On 1 November 1969 the 515th Engineer Platoon (Asphalt) was assigned to the 159th Engineer Group and attached to the 92nd Engineer Battalion. On 14 November 1969 the 515th moved from Cu Chi to Black Diamond (formerly Xom Tam) Quarry to set up a continuous mix asphalt plant.

On 7 November 1969 companies B and C of the 46th Engineer Battalion moved from Long Binh to Xuan Loc and Gia Ray respectively. These moves were in support of the upgrade of National Route One from the intersection of QL-20 and QL-1 (YT 3410) to Gia Ray (YT 4308). Also on 7 November 1969 the asphalt platoon of the 103rd Engineer Company (CS) reverted to company control at Resor Quarry (XT 9712) from the 34th Engineer Battalion at Phu Loi (XT 8616).

The 544th Engineer Company (CS) was assigned to the 159th Engineer Group on 14 November 1969 and was attached to the 169th Engineer Battalion. The unit moved from Nui Ba Den to Banana Quarry (YT 3416) on 1 December 1969 to establish a quarry and operate the largest military rock crusher in Vietnam and a continuous mix asphalt plant. The 544th Engineer Company (CS) was supplemented by a quarry section from the 595th and 557th Engineer Companies (LE) respectively.

The 100th Engineer Company (Float Bridge) was reassigned to the 79th Engineer Group on 5 December 1969. One platoon of the 362nd Engineer Company (LE) was attached to the group and further attached to the 34th Engineer Battalion for the period 22 December 1969 to 23 January 1970. One platoon of the 517th Engineer Company (LE) was attached to the group and further attached to the 92nd Engineer Battalion on 23 December 1969. The platoon arrived at Long Thanh North on 2 January 1970 and is still presently attached.

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On 1 January 1970 the 714th Engineer Detachment (Power) was assigned to the 159th Engineer Group. The 714th was attached to the 46th Engineer Battalion at Long Binh.

On 12 January 1970 Company D of the 34th Engineer Battalion moved from Phu Loi (XT 8616) to a fire support base along province route 1a (XT 8637) to support the upgrade of province routes 2A and 1A from QL-13 to Phuoc Vinh.

f. Visitors and Awards:

(1) The following visitors were given briefings and/or tours in the 159th Engineer Group during the reporting period:

- (a) 4 Nov 69 COL O'Donnell, CO, 20th Engr Bde
- (b) 5 Nov 69 BG Tarbox, CG, United States Army Engineer Construction Agency Vietnam (USAECAV)
- (c) 6-7 Nov 69 Mr. Fox, Editor, Engineering News-Record
- (d) 9 Nov 69 MG McGawn, DCG, IIFFV
- (e) 10 Nov 69 COL Nicholson
- (f) 12 Nov 69 COL O'Donnell, CO, 20th Engr Bde
- (g) 17 Nov 69 COL O'Donnell, CO, 20th Engr Bde
- (h) 18 Nov 69 Mr. Caywood, USARPAC Engr Section
- (i) 19 Nov 69 COL O'Donnell, CO, 20th Engr Bde
- (j) 20 Nov 69 COL Fuller and staff, 20th Engr Bde
- (k) 29 Nov 69 COL O'Donnell, CO, 20th Engr Bde
- (l) 1 Dec 69 COL Wright, CO, 79th Engr Gp
- (m) 3 Dec 69 BG Dillard, CG, Engr Trps, VN
- (n) 6,8 Dec 69 LTG Clarke, Chief of Engineers, and party
- (o) 9 Dec 69 BG Tarbox, CG, USAECAV
- (p) 16 Dec 69 BG Powers, D/CS for Personnel and Administration, USARV
- (q) 17 Dec 69 COL O'Donnell, CO, 20th Engr Bde

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- (r) 20 Dec 69 COL Devine, Chief, Military Operations, Engr Trps, USARV
- (s) 21 Dec 69 COL O'Donnell, CO, 20th Engr Bde
- (t) 22 Dec 69 LTC Nghia, III CTZ ARVN Engineer
- (u) 23 Dec 69 BG Tarbox, CG, USAECAV
- (v) 24-25 Dec 69 BG Dillard, CG, Engr Trps, VN
- (w) 25 Dec 69 BG Tarbox, CG, USAECAV
- (x) 27 Dec 69 BG Shoemaker, ADC, 1st Air Cav Div
- (y) 27 Dec 69 COL O'Donnell, CO, 20th Engr Bde
- (z) 28 Dec 69 COL O'Donnell, CO, 20th Engr Bde
- (aa) 29 Dec 69 BG Dillard, CG, Engr Trps, VN
- (bb) 31 Dec 69 COL Chidlaw, DC, USAECAV
- (cc) 3 Jan 70 COL Worthington, Chief Const Division, USAECAV
- (dd) 5 Jan 70 BG Shoemaker, ADC, 1st Air Cav Div
- (ee) 7 Jan 70 BG Tarbox, CG, USAECAV
- (ff) 7 Jan 70 BG Shoemaker, ADC, 1st Air Cav Div
- (gg) 8 Jan 70 BG Dillard, CG, Engr Trps, VN
- (hh) 11 Jan 70 COL Carter, Army Material Command
- (ii) 14 Jan 70 BG Dillard, CG, Engr Trps
- (jj) 19 Jan 70 COL Fuller, DC, 20th Engr Bde
- (kk) 20 Jan 70 COL O'Donnell, CO, 20th Engr Bde
- (ll) 21 Jan 70 COL Wright, CO, 79th Engr Gp
- (mm) 24 Jan 70 COL O'Donnell, CO, 20th Engr Bde
- (nn) 25 Jan 70 COL O'Donnell, CO, 20th Engr Bde
- (oo) 26 Jan 70 COL O'Donnell, CO, 20th Engr Bde

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(pp) 27 Jan 70 COL O'Donnell, CO, 20th Engr Bde

(qq) 31 Jan 70 CPT Paul, USN, Deputy OICC, RVN

(2) Awards: The following awards were presented during this reporting period:

(a) Army Commendation Medal-Svc	401
(b) Army Commendation Medal-Ach	42
(c) Bronze Star Medal-Service	180
(d) Bronze Star Medal-Ach	5
(e) Purple Heart	7
(f) Air Medal	2
(g) Legion of Merit	1
TOTAL AWARDS RECEIVED:	683

2. PERSONNEL, MORALE AND DISCIPLINE:

a. Personnel:

(1) The consolidated strength figures for the reporting period are as follows:

(a) As of 30 Nov 69

	<u>OFF</u>	<u>WO</u>	<u>EM</u>	<u>TOTAL</u>
AUTH	178	42	4160	4380
ASG	184	41	3676	3901

(b) As of 31 Dec 69

AUTH	169	40	3735	3944
ASG	168	42	3934	4144

(c) As of 31 Jan 70

AUTH	170	40	3747	3957
ASG	163	40	3655	3858

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(2) There continued to be a critical shortage of E-6, squad leaders throughout the Group.

(3) Effective 20 December 1969 the 159th Engineer Group lost 168 augmentation slots from the 62nd Engineer Battalion.

b. Morale:

(1) The morale remained high throughout the 159th Engineer Group during the reporting period.

(2) There were 187 men who voluntarily extended their tours of duty for 6 months or longer. There were 151 men who extended their tours of duty for less than six months.

(3) The reenlistment rate was very good with 33 first term and AUS personnel reenlisting. The cumulative USARV objective was 52, for a group 63 percent reenlistment rate.

c. Discipline: There were only 21 special courts-martial during the period and 415 article 15's were administered. Summary courts are now used only on rare occasions.

d. Casualties: The 159th Engineer Group suffered the following casualties during the reporting period:

KIA: 0

WIA: 3

NHD: 3

3. INTELLIGENCE

a. During the period 1 Nov 69 to 31 Jan 70 the 159th Engineer Group continued its program of daily intelligence briefings and the dissemination of all available tactical and technical intelligence to subordinate units. Liaison visits were made daily to HQ, LBP and other available intelligence agencies of the FWMF to insure that all intelligence information is made available to the Group and subordinate units.

b. The Group remains responsible for the defense of one of the four defensive sectors of Long Binh Post. The sector of responsibility lies on the southern perimeter of the post and consists of 39 primary bunkers and three 60' observation towers. The 159th Group sector has three critical installations.

c. Continual improvements have been made to the 159th Engineer Group Sector. Some of the main improvements are summarized below:

(1) Installation of one 81mm mortar to fire illumination for the sector perimeter.

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- (2) Installation of an additional primary bunker.
- (3) Installation of perimeter lighting throughout the sector.
- (4) Continued construction of the defensive berm between primary bunkers.
- (5) Utilization of special sniper teams on the perimeter.

d. The 159th Engineer Group Sector has continued its program of tri-weekly patrols outside the perimeter and the training program for forward observers and crater analysis teams.

e. There was one significant enemy action in the 159th Engineer Group sector during this reporting period. Enemy forces launched a stand-off rocket attack which resulted in one WIA and minor damage. Counter rocket fire was fired with unknown results.

4. OPERATIONS, PLANS, AND TRAINING

a. The following projects were completed by the 159th Engineer Group during the reporting period.

(1) Combat/Operational Support

(a) 153-5409-0-20, Bridge Support, Dry Spans, 92nd Engr Bn:
Three 38'-4" M4T6 dry spans were delivered to the 8th Engr Bn at Quan Loi. A demonstration was presented on how to prepare the bridge for airlifting, and three personnel were provided for the duration of the mission for technical assistance. Project completed 10 December 1969.

(b) 173-5410-0-20, Foot Bridge Support, Duc Hoa, 92nd Engr Bn:
One 160' long foot bridge was delivered to Cu Chi in support of the 65th Engr Bn. Project completed 4 November 1969.

(c) 189-5420-0-20, Dry Gap Span, 199th Inf. Bde, 92nd Engr Bn:
One 90' M4T6 dry span with intermediate trestles was installed in support of the 87th Engr Co to provide stream-crossing capability for Rome plows. Project completed 6 December 1969.

(d) 146-5426-0-20, Establish Temporary Fire Support Base, 92nd Engr Bn:
Protective berms were constructed around 6 howitzers at a fire support base in Long Khanh Province using D7E dozers. Project completed 18 December 1969.

(e) 189-5433-0-00, FSB Diane, 46th Engr Bn: Constructed perimeter berm, cleared and grubbed around perimeter, and constructed POL and Ammo Storage areas. Project completed 3 January 1970.

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(f) 146-5435-0-20, Open New Fire Support Base, 92nd Engr Bn:
A fire support base at a classified location was constructed using the D7E dozer to shape berms. Project completed 8 January 1970.

(g) 146-5437-0-20, Equipment Support, 199th Inf Bde, 92nd Engr Bn:
One dozer was provided for one day to shape berms for a fire support base in Long Khanh Province. Project completed 5 January 1970.

(h) 189-5441-0-20, Dozer Support, FSB Nancy, 169th Engr Bn:
Constructed firing positions and berm. Project completed 16 January 1970.

(i) 189-5944-0-20, Dozer Support 199th Inf Bde, 169th Engr Bn:
Constructed firing positions and berm. Project completed 24 January 1970.

(j) 189-5545-0-20, Dozer Support, 199th Inf Bde, 169th Engr Bn:
Constructed firing positions and berm. Completed 17 January 1970.

(k) 189-5446-0-20, Equipment Support, 92nd Engr Bn: One lowboy was provided to the 79th Group for one day. Project completed 25 January 1970.

(l) During this quarter, the Carpenter Shop, 46th Engineer Battalion, 543-5302-0-20, prefabricated the following items in accordance with operational support directives:

- 1 5 Columbine, 4 man, fighting bunkers, 10' x 10'
- 2 28 Rose, 12 man, reaction bunkers, 28' x 20'
- 3 6 Daisy, 24 man, personnel mortar bunkers, 7' x 24'

(m) 159-68-233, Trang Bom Tank Range, 92nd Engr Bn: 52,750 SY of jungle were cleared, 46,440 CY of overburden was stripped from laterite pits and the construction site, and 86,195 CY of laterite fill was used in the project. 3200 meters of access road was constructed and one 2750 meter "assault" road in the firing range itself was constructed. 6-48" culverts and eight each 24" culverts were installed, and the headwalls of the culverts were backfilled with 604 tons of 10"(-) rock. One 20,000 SM firing pad was constructed and two target berms were constructed using 25,000 CY of laterite fill. Project completed 13 December 1969.

(n) 273-5461-2-20, Binh Loi Fender System, 92nd Engr Bn:
Port construction support was provided to the 46th Engr Bn by the 497th (PC) from 14 June 1969 to 18 August 1969, when they were detached from the 92nd Engr Bn. The 497th constructed one fender and assisted in the completion of the floating collar system during this time. From 18 August 1969 to 30 November 1969 the 41st (PC) completed the mission by constructing

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the remaining 3 fenders of the system and by anchoring the upstream side of the floating collar system. The collars are floating stand-off barriers around the piers, and the fenders are protective measures used to channelize barge traffic away from the floating collars. Project completed 30 September 69.

(o) 243-5502-0-20, Security Upgrade, Sanford AAF, 92nd Engr Bn: Cleared vegetation around Sanford and supervised self-help installation of defensive wire. 68% completed when project was terminated 1 December 1969.

(p) 243-5510-1-23, BOQ Revetments, 92nd Engr Bn: Four foot revetments were constructed around 5 Long Binh Post BOQ's. Project completed 1 November 1969.

(q) 291-5559-0-20, Bridge Security Maintenance, 92nd Engr Bn: Pier protective systems were constructed around 5 piers of the Nha Be Bridge. System consisted of a floating collar around each pier from which was hung chain link fence and concertina as an anti-sapper measure. Project completed 24 December 1969.

(r) 243-5686-0-20, Construction of SOC, 53rd General Support Group, 92nd Engr Bn: Technical assistance was provided between 14 January 69 and 4 January 1970 in the self-help construction of the SOC. Project terminated 9 January 1970.

(s) 253-5709-0-20, 1st Cav TOC Bunker, 46th Engr Bn: 40' x 60' concrete pad was placed and 12" x 12" columns placed with 12" x 16" beams on top. The roof was decked with 3/8" lumber, two layers of sandbags and roofing tin. Revetments 8' high, 24" at top and 48" at bottom, were built around the building. Electrical facilities were installed and plywood applied to interior partition. Project completed 10 November 1969.

(t) 243-5736-0-20, Access Road, Long Binh Post, 92nd Engr Bn: A 700-meter, single lane, minimum standard road was constructed to provide easy access to a Long Binh perimeter defense bunker. Project completed 19 November 1969.

(u) 290-5765-0-20, Construction of Guard Towers and Revetments, Xuan Loc, 169th Engr Bn: Constructed 24 aircraft revetments and 4 guard towers. Project completed 4 December 1969.

(v) 246-5801-0-20, Repair Aircraft Revetments, Long Thanh North, 92nd Engr Bn: Twenty 12 foot high fixed wing aircraft revetments were repaired by reinforcing the existing revetments with "H" beam stiffeners set in concrete. Three - 3' high earth berms were constructed around 3 existing fuel bladders. 21 - 24-man personnel bunkers were constructed. Project completed 5 November 1969.

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(w) 207-5812-0-20, Perimeter Bunker Construction, Phu Cuong, MACV Site, 34th Engr Bn: Constructed 12 - 10' x 10' perimeter bunkers. Project completed 1 December 1969.

(x) 246-5830-0-20, Helicopter Revetments Bearcat, 92nd Engr Bn: Constructed 5 OH-13 K-wall revetments consisting of two parallel walls 35' long & 4' high, and two CH-47 standard corrugated sheet metal and wood design revetments consisting of two parallel walls 35' long & 9' high. Project completed 30 November 1969.

(y) 243-5849-0-20, Land Clearing, Providence Village, 169th Engr Bn: Cleared approximately 50 acres of bamboo and brush. Project completed 15 January 1970.

(z) 243-5867-0-20, Sanford Airfield Improvements, 92nd Engr Bn: Eleven CH54 revetments were improved by constructing a 12-foot high end-wall revetment between existing parallel revetments. Four U-shaped U-21 revetments, 12' high and a 500 SY hardstand and taxiway were constructed. Six parallel revetments for UH-10's were converted into L-shaped revetments for gunships. One 7600 SY hardstand and four 4' x 9' x 40' blast walls were constructed for a gunship re-arm point. Project completed 31 December 1969.

(aa) 243-5872-0-20, Equipment Support Plantation, 92nd Engr Bn: One D7E dozer, frontloader and dump truck support was provided to build a firing range for the 199th Inf Bde. A total of 1635 CY of fill was used in construction of the berm. Project completed 1 November 1969.

(bb) 243-5892-0-20, Timber Trestle Bridge Repair, 92nd Engr Bn: Minor repairs were accomplished by installing 400 feet of 2 x 6 lumber for decking. Project completed 6 November 1969.

(cc) 243-5894-0-20, Engineer Support, IIFFV, 92nd Engr Bn: Protective berms were constructed around six 155 howitzer positions for the 35th Arty Gp. Project completed 3 November 1969.

(dd) 217-5901-0-20, Upgrade of Di An ASP, 34th Engr Bn: Rehabilitated existing berms and drainage system. Project completed 14 January 1970.

(ee) 273-5910-0-20, Remove Float Bridge, Ben Luc, 92nd Engr Bn: Technical assistance and hauling capability were provided to the 30th ARVN Pmr Gp for the removal of a 1200' M4T6 float bridge. Project completed 15 November 1969.

(ff) 243-5924-0-20, Defense Upgrade, Plantation, 46th Engr Bn: Constructed 1,000 meters of pioneer road and cleared 300 SM of hill top for improving fields of fire. Project completed 20 November 1969.

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(gg) 207-5933-0-20, Pier Repair, Bien Hoa Barge Site, 92nd Engr Bn: One stringer and all decking and curbing were replaced on the pier at the Bien Hoa barge site. Two transverse braces were repaired. Project completed 6 November 1969.

(hh) 289-5944-0-20, Living Fighting Bunker Construction for Company D, 169th Engr Bn: Constructed 6 living fighting bunkers. Project completed 4 January 1970.

(ii) 243-5945-0-20, Land Clearing Hill 837, 169th Engr Bn: Cut trees in front of signal site perimeter. Project completed 16 January 1970.

(jj) 251-5950-0-20, Repair Culverts Bien Hoa Highway, 92nd Engr Bn: Two 24 inch 30 foot culverts were replaced on Highway 316 in support of the 1st Inf Div. Project completed 11 November 1969.

(kk) 289-5961-0-20, POL Protective Berms, 46th Engr Bn: Cleared a 25,000 square yard area and built fuel storage area to accomodate four 10,000 gallon fuel bladders. Constructed a helicopter landing area for 13 aircraft using approximately 600 pieces of PSP and the entire area peneprimed. Project completed 18 November 1969.

(ll) 290-5963-0-20, Radar Towers, Saigon, 92nd Engr Bn: Two each 45' radar towers were erected in the Saigon Area and four 10' x 10' prefabricated bunkers were provided to the personnel at one of the sites. Project completed 17 December 1969.

(mm) 207-5964-0-20, Radio Antenna Farm, for 175th Radio Research Company, 46th Engr Bn: Cleared a 325 foot diameter circle and placed a 3" laterite cover over the area. Project completed 17 November 1969.

(nn) 287-5974-0-20, M4T6 Bridge Removal QL-15, 92nd Engr Bn: Technical assistance and equipment support was provided to the 1st Australian Task Force for the removal of a 206 foot M4T6 float bridge on QL-15. Project completed November 1969.

(oo) 289-5983-0-20, FSB Husky Rehabilitation, 46th Engr Bn: Constructed four firing pads for 175mm and 8" guns and four 12-man living bunkers. Two bunkers were joined to serve as a FDC, aid station, and commo shack. Project completed on 12 December 1969.

(pp) 246-6001-0-20, Long Thanh North Army Airfield, 92nd Engr Bn: 300 meters of perimeter earth berm were constructed and 300 meters of existing berm were upgraded. Four 10' x 10' fighting bunkers, 3 8-foot observation towers and 3 ammunition bunkers were prefabricated and delivered to the user for self-help erection. Project completed 10 December 1969.

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(qq) 290-6002-0-20, Dry Span Support for Land Clearing, 92nd Engr Bn: A 45-foot M4T6 fixed span was delivered by air in support of a small stream crossing by the 199th Inf Bde. Technical assistance was provided in erection. Project completed 3 November 1969.

(rr) 243-6003-0-20, Raft Mission, 92nd Engr Bn: One 5-float M4T6 reinforced raft was constructed on a La Nga River and utilized to cross 3 artillery howitzers in support of 23rd Artillery Group. Project completed 5 November 1969.

(ss) 273-6007-0-20, LST Ramp Repair at Newport, 92nd Engr Bn: Technical assistance was provided to the 4th Trans Co in the repair of an LST Ramp. Project completed 11 December 1969.

(tt) 207-6008-0-20, Concrete Revetment Construction, 46th Engr Bn: Constructed 64 LF of 4' high revetment. Project completed 23 November 1969.

(uu) 243-6012-0-20, Crypto Center Security, 92nd Engr Bn: A nine foot high precast concrete revetment 50 feet long was constructed and erected around the 92nd Engr Bn Crypto Facility. A chain link fence was erected and a concrete pad for a generator was poured in the vicinity of the battalion operations center. Project completed 29 December 1969.

(vv) 287-6016-0-20, Dry Span Support to 1st Australian Task Force, 92nd Engr Bn: 150 feet of M4T6 Bridge (dry span) was delivered to the 1st Australian Task Force at Nui Dat. Project completed 24 November 1969.

(ww) 240-6019-0-20, Truck Support for Chanh Luu Bypass, 34th Engr Bn: Supplied 79th Engineer Group with 15 dump trucks for 3 days. Project completed 19 November 1969.

(xx) 225-6020-0-20, Footbridge Support, 92nd Engr Bn: One 300-foot aluminum foot-bridge was delivered to the 571st Engr Co at Cu Chi. Technical assistance was given on preparation of the bridge for air-lifting. Project completed 23 November 1969.

(yy) 212-6029-0-20, Equipment Support to 79th Engr Gp, 92nd Engr Bn: Eight 10-ton tractors and seven 25-ton lowbeds with operators and guards supported the 79th Engr Gp for a unit movement from Long Binh to Lai Khe. Project completed 6 December 1969.

(zz) 217-6032-0-20, MSR 25 Bridge Upgrade, 34th Engr Bn: Replaced decking and treadway on two bridges. Project completed 18 January 1970.

(aaa) 246-6054-0-20, Equipment Support, Royal Thai Army Volunteer Force, 92nd Engr Bn: Three dozers with operators were provided for one week for construction of protective berms at a fire support base and to clear fields of fire out to a distance of 200 meters. Project completed 21 December 1969.

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(bbb) 243-6034-0-20, Clearing Finger Ridge, 92nd Engr Bn:
323 acres were cleared of vegetation from a ridgeline south of Long Binh Post. Project completed 28 January 1970.

(ccc) 243-6065-0-20, Sanford Heliport Support, 92nd Engr Bn:
3000 feet of chain link fence was erected around part of Sanford AAF as an anti-sapper defense measure. Vegetation was cleared out to a distance of 200m from the fence. Project completed 31 January 1970.

(ddd) 290-6080-0-20, Equipment Support, 79th Engr Gp, 169th/92nd Engineer Battalions: Provided four 25-ton trailers with tractors. Project completed 16 January 1970.

(eee) 273-6085-0-20, Diver Support, 92nd Engr Bn: Divers investigated a river bottom obstruction at Newport Docks. The obstruction was found to be a silt bar. Project completed 13 January 1970.

(fff) 246-6099-0-20, Minesweep, 92nd Engr Bn: An area 50m x 100m, on QL-15 was swept for possible mines. Project completed 24 January 1970.

(ggg) 243-6106-0-20, Equipment Support, 79th Engr Gp, 169th Engr Bn: Provided two 25-ton trailers with tractors. Project completed 30 January 1970.

(2) Minimum Essential Requirements

(a) 159-68-014, 378th Maintenance Support Company, 92nd Engr Bn:
A 5500 SY hardstand with 3-inch laterite cap was constructed and peneprimed. Completed 7 November 1969.

(b) 159-69-006, MER for 379th Transportation Company (MT), 46th Engr Bn: Hauled, graded and compacted 5,040 cubic yards of laterite fill. Reshaped, graded and compacted 9,950 cubic yards of laterite. Placed 60 ft of 12-inch culvert and 70 ft of 18" culvert and peneprimed the area. Project completed 7 December 1969.

(c) 351-5301-0-20, MER for 3rd Brigade, 82nd Abn Div, 34th Engr Bn: Placed 24' x 90' concrete pad and assisted in placing 2 other pads with 82nd Abn Div self-help. Project completed 2 November 1969.

(d) 391-5310-0-20, MER Carpenter Shop 46th Engr Bn: Pre-fabricated the following items in accordance with minimum essential requirements directives:

- 1 5 12-head showers, skid mounted
- 2 1 6-head shower, skid mounted
- 3 6 12-hole latrines, skid mounted
- 4 2 9-hole latrines, skid mounted

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(e) 391-5310-6-20, MER for 82nd Abn Div, 34th Engr Bn:
Constructed one latrine and shower. Project completed 27 October 1969.

(f) 343-5311-0-20, Hardstand and Access Road for 543 Trans Co, 46th Engr Bn: Constructed 22,600 SY of hardstand with access road around pad using 30,000 CY of fill. Latrines and showers were prefabricated and erected on site. Project completed 7 November 1969.

(g) During this quarter, the 46th Engr Bn Carpenter Shop, MER 391-5311-0-20, prefabricated the following items in accordance with minimum essential requirements directives:

- 1 2 4-hole latrines, skid mounted
- 2 9 6-hole latrines, skid mounted
- 3 2 12-hole latrines, skid mounted
- 4 3 4-head showers, skid mounted
- 5 3 6-head showers, skid mounted
- 6 1 8-head shower, skid mounted

(h) 343-5318-0-20, MER, 9th Med Lab, Long Binh Post, 46th Engr Bn: Constructed a 3,800 square yard peneprimed hardstand with two access roads and placed 60 feet of 36 inch culvert. The hardstand area required 1880 cubic yards of fill. Project completed 15 November 1969.

(3) Lines of Communication:

(a) 98-240-159-LOC, Restoration of QL-20, from QL-1 to Trai Lam Cay, 169th Engr Bn: Constructed 9.5 kilometers of MACV Standard A highway and 48.5 kilometers of all weather highway. Project terminated 1 November 1969.

(b) 159-68-004, Resor Quarry Cantonment Area, 46th Engr Bn: Constructed ammo bunkers, mess hall, orderly room, supply room, latrine, shower, troop billets, flood and security lighting, electrical distribution, sanitary sewage system, and water storage tank for the 103rd Engineer Company. Project completed 4 November 1969.

(c) 407-5301-0-20, Site Preparation and Relocation of Asphalt Plant, Resor Quarry, 46th Engr Bn: Constructed concrete pads for the asphalt plant, headwalls, access roads, open storage areas and ground culvert drainage. Project completed 20 January 1970.

(d) 417-5304-0-20, Additional Cantonment Facilities, Xom Tam, 92nd Engr Bn: Six 20' x 48' South East Huts were disassembled and the salvaged materials were used to construct one 20' x 96' SEA hut at the Xom Tam Industrial Site. Project completed 20 December 1969.

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(e) 489-5301-0-20, Establish Asphalt Plant, and Rock Crusher, Gia Kiem, 544th Engineer Company (CS): Set up a crusher complex and asphalt plant. Project completed 23 January 1970.

(4) Base Construction

(a) 12-231-01, Site Preparation, Phu Loi Power Plant, 169th Engr Bn: Constructed POL berm and improved drainage. Project completed 12 November 1969.

(b) 46-228-01, Civilian Quarters, 34th General Support Group, Long Thanh North, 92nd Engr Bn: Two 20' x 96' BEQ's were constructed. Project terminated 1 December 1969 at 87% completion.

(c) 525-0304-0-01, Removal and Storage of Pre-Engineered Buildings, Dong Tam, 46th Engr Bn: Dismantled one 70' x 144' Pascoe Building and three 40' x 96' Pascoes and hauled them to the 46th Engineer Battalion S-4 Yard. Hauled two Pascoes to 46th Engr Bn S-4 Yard that had been stored in the 93rd Engr Bn S-4 Yard. Project completed 27 October 1969.

(d) 543-0301-0-01, SEA Signal School, 46th Engr Bn: Constructed thirteen 20' x 60' concrete pads, one 35' x 120' concrete hardstand, one detached latrine and shower with water tower and water storage tank, 400 LF of fence, thirteen 20' x 60' Adam Huts, and interior and exterior wiring for the buildings. Project completed 29 December 1969.

(e) 543-0303-0-01, LOC Maintenance Facility, 46th Engr Bn: Constructed 600 x 400' hardstand with drainage and access road and a 3 building maintenance complex with asphalt parking area, wash rack, loading ramp, latrine and security fence. Project completed 12 November 1969.

(f) 543-5305-0-20, Move Porta-Campers, 92nd Engr Bn: Four porta-campers were relocated from the 92nd Engr Bn area to the MCA-LOC maintenance area. Project completed 31 December 1969.

(g) 543-0309-0-01, Twelve Gate Entrance to Long Binh Depot near Ho Nai Village, 92nd Engr Bn: Constructed a 37' by 77' concrete block building with twelve checkpoints and two 48' x 77' covered waiting areas on either side. Project completed 17 December 1969.

(5) Material Issue

(a) 710-0303-1-20, Storage, Crating, and Transportation of Construction Materials, for 5th Special Forces Group, Chi Lang, 92nd Engr Bn: Material was received, crated and palletized, marked, stored and transported Bien Hoa Air Terminal. Project completed 15 January 1970.

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(b) 712-0305-0-01, Issue Rock and Sand to PA&E, Quan Loi, 34th Engr Bn: Hauled 108 CM of crushed rock and 60 CM of sand from Phu Loi to PA&E at Quan Loi. Project complete 21 January 1970.

(c) 743-0305-0-01, Concrete Block for Amphitheater, Long Binh Post, 46th Engineer Battalion: Issued 22,160 concrete blocks to Long Binh Post Special Services for use as seats in the Long Binh Post Amphitheater. Project completed 26 December 1969.

(d) 773-5302-0-20, Concrete Block Issue for Protective Bunkers, MACV Headquarters, Saigon, 46th Engr Bn: Issued 6,000 palletized concrete blocks to MACV Headquarters, Saigon. Project completed 19 January 1970.

(e) 791-5303-0-20, Rock Issue to Installation Engineers, 46th Engr Bn: Issued 220 CY of crushed rock. Project completed 31 December 1969.

(6) MACV Advisor Facilities

(a) 12-260-01, MACV Advisor Facility, Phu Cuong, 34th Engr Bn: Completed all facilities. Project completed 25 November 1969.

(b) 43-359-01-159, MACV Advisor Facility Upgrade, Ham Tan, Binh Tuy, 169th Engr Bn: Attempt to drill a well was abandoned due to unstable ground conditions. Project terminated 31 January 1970.

(c) 87-242-01, MACV Advisory Facilities Ba Ria, 92nd Engr Bn: Constructed a 988 SF maintenance building. Project completed 31 December 1969.

(d) 812-0311-0-01, MACV Advisor Facilities, Chau Thanh, 34th Engr Bn: Constructed 480 SF of troop housing with latrine and shower. Project completed 21 January 1970.

(e) 873-0302-0-01, MACV Advisor Facility, Binh Chanh, 46th Engr Bn: Constructed a 9' x 14' latrine and shower of concrete blocks and louvred wood, septic tank 8' x 8' x 5', and installed a thirty gallon hot water heater. Project completed 23 December 1969.

(f) 873-0303-0-01, MACV Advisor Facility, Cat Lai, 46th Engr Bn: Constructed 1,134 SF billets to include shower and latrine, water distribution and sewage collection system, water tower and septic tank, sidewalks, hot water heater, and area landscaping. Project completed 27 October 1969.

(g) 887-0302-0-01, MACV Advisory Facilities, Long Hai, 92nd Engr Bn: Constructed a 20' x 56' concrete block building providing billets, mess hall, covered storage, administration facilities and community facilities, a maintenance/generator shed, electrical distribution system, water distribution system, and a water born sewage system. Project completed 10 December 1969.

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(h) 889-0302-0-01, MACV Advisory Facility, 46th Engr Bn: Constructed timber water tower with two 500 gallon water tanks and connected to existing plumbing. Project completed on 18 January 1970.

(i) 889-0303-0-01, MACV Housing Latrine, 46th Engr Bn: Constructed concrete block latrine and two septic tanks. The water is supplied by two water bladders, each 600 gallons. Project completed 31 January 1970.

b. The following projects are still active and construction will continue into the next reporting period:

(1) Combat/Operational Support

(a) 291-5559-0-20, Bridge Security Maintenance, Dong Nai Bridge, 92nd Engr Bn: Repairs were made on the existing RMK-installed pier protective systems on three piers as a temporary protective measure. Existing contractor-installed system around one pier was removed and replaced with a steel pile and floating system designed by the 41st Engr Co (PC). Project is 71% complete.

(b) 243-5729-1-23, Maintenance of Base Camp Perimeter, 46th Engr Bn: Work accomplished during this period included continuous repair of perimeter bunkers; capping of revetment barrels around billets with cement; and clearing vegetation from the perimeter area. Project is continuous.

(c) 243-5729-2-23, Maintenance of Long Binh Perimeter, 92nd Engr Bn: Burned and removed vegetation, replaced 312 trip flares, installed 842 rolls of barbed wire, and built-up berm with 484 CY of laterite. Installed 4 bunkers. Project is continuous.

(d) 243-5729-3-23, Maintenance Base Camp Perimeter, Long Binh Post, 169th Engr Bn: Repaired bunkers and installed concertina and trip flares. Project is continuous.

(e) 251-5730-0-20, Maintenance of Base Camp Perimeter, Phu Loi, 34th Engr Bn: Replaced perimeter wire and removed vegetation. Project is continuous.

(f) 243-5731-0-20, Resor Quarry Perimeter, 46th Engr Bn: Constructed a triple concertina and two strand barb wire entanglement perimeter for the 103rd Engineer Company using 30,500 linear feet of triple concertina and 31,500 linear feet of barb wire. Project is continuous.

(g) 243-5732-0-20, Maintenance of Xom Tam Perimeter, 92nd Engr Bn: Installed concertina wire and trip flares, repaired existing bunkers and berm, and constructed two 10' x 10' fighting bunkers. Project is continuous.

(h) 243-5839-0-20, Equipment Support for IIFFV, 92nd Engr Bn: Hauled 130 CY of laterite. Project is presently 60% complete.

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(i) 243-5897-0-20, Revetment Construction, 93rd Evacuation Hospital, Long Binh, 46th Engineer Battalion: Constructed 560 feet of precast reinforced concrete revetments around the ward buildings in the 93rd Evacuation Hospital area. Project is 52% complete.

(j) 289-5945-0-20, Living Fighting Bunker Construction for B Company, 169th Engr Bn: Constructed 17 bunkers for base camp. Project is 94% complete.

(k) 291-5986-0-20, Tactical Roads, 34th and 92nd Engr Bn: Projects includes upgrade to Class 12 of 79.2 kilometers of secondary roads in III CTZ. Project is 20% complete.

(l) 212-6041-0-20, Rock Issue to 65th Engr Bn, 92nd Engr Bn: 383 CY of 1 $\frac{1}{2}$ "(-) rock was issued to the 65th Engr Bn during this period. Project is 40% complete.

(m) 290-6062-0-20, Support for Aviation Units, 92nd Engr Bn: Scope - classified. Project is 47% complete.

(n) 290-6063-0-20, Operational Support for Aviation Maintenance Units, Phu Loi, 34th Engr Bn: Constructed aircraft revetments and relocated 6 buildings. Project is 80% complete.

(2) Minimum Essential Requirements

(a) 389-5302-0-20, MER for C Company, 46th Engr Bn: Latrines and showers are constructed, and interior roads have been upgraded. Project is 43% complete.

(b) 389-5303-0-20, Mess Hall Slab, B Company, 46th Engr Bn: Poured approximately 5 cubic yards of concrete for floor and extended walls to accommodate expanded floor. Project is 40% complete.

(c) 389-5304-0-20, MER for 2nd Battalion/35th Arty, FSB Nancy, 46th Engr Bn: Constructed one 4-head shower. Project is 50% complete.

(3) Base Construction

(a) 517-0301-0-01, Water Supply Facility, Di An, 34th Engr Bn: Well drilled by 169th Engineer Battalion. Remainder of construction is suspended. 45% complete.

(b) 543-0306-0-01, Cantonment Facilities, 6th Trans Bn, 46th Engr Bn: Project started 30 July 1969, was suspended 11 August 1969, and reactivated 9 January 1970. Six Pascoes are nearly complete. Project is 35% complete.

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(c) 543-0310-0-01, Post Exchange, Long Binh, 46th Engr Bn:

Work accomplished during this period included the excavation of the job site; forming and pouring a 70' x 144' concrete pad; preparing two vehicle parking areas; erection of a 70' x 144' Pascoe Building; forming and pouring three air conditioning pads, and starting work on interior walls and electrical distribution system. Project is 43% complete.

(d) 543-0311-0-01, Exchange Administration Building, Long Binh, 46th Engr Bn: Earthwork completed due to concurrent work on adjoining project. Project is 5% complete.

(4) Lines of Communication

Roads:

(a) 98-217-159, Route QL-13 Restoration, Phu Cuong to Lai Khe, 34th Engr Bn: Paving is completed. Continued to place rock on shoulders. Project is 96% complete.

(b) 407-0302-0-01, Route LTL1A/TL2A Restoration, QL-13 to Phuoc Vinh, 34th Engr Bn: Restored 39.8 KM of highway to MACV Class "C" standard. 196,000 CY of subbase material has been moved. 41,762 CY of base course has been placed to prepare 10.6 kilometers for paving and 8185 tons of asphalt has been laid to complete 5.2 kilometers of double lane paving. Project is 33% complete.

(c) 489-0302-0-01, LOC Restoration QL-1, 46th Engr Bn: Subgrade has been completed from the intersection of QL-1 and QL-20 to the south end of Xuan Loc. 23,327 CY of base rock has been placed in a 4" lift to prepare 15.4 kilometers for paving. The first layer of asphalt, a 3" lift, has been placed on 6.78 kilometers. Bypass roads have been built all along QL-1 wherever possible. Project is 27% complete.

(d) 489-0303-0-01, LOC Restoration of QL-1, 46th Engr Bn: Subgrade has been completed for 5.9 kilometers. Project is 14% complete.

(e) QL-20, FY 70 Program, Restoration of QL-20 from QL-1 to II/III Corp border, 169th Engr Bn: Laid second lift of asphalt from QL-1 to Gia Kiem to complete 9.5 kilometers. 114 kilometers of base course and 12.9 kilometers of first lift asphalt placed. Project is 23% complete.

Support Operations

(a) 407-5302-0-20, Operations of Resor Quarry and Asphalt Plant, 46th Engr Bn: Produced 12,992 CY of 3"(-) base course, 34,955 CY of 2"(-) base course, 5,115 CY of 1 $\frac{1}{2}$ "(-) base course and 20,044 CY of 3/4"(-) asphalt aggregate. Produced 14,224 tons of Type IV asphalt cement during the reporting period. Work was completed on the installation of the KA-60 Asphalt Plant and operation was started the 29th of December 1969. Project is continuous.

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(b) 443-5311-0-20, Operation and Maintenance of Concrete Batch Plant at Long Binh, 92nd Engr Bn: 2882 CY of concrete were produced during this period. Project is continuous.

(c) 443-5212-0-20, Laterite Pit, 46th and 92nd Engr Bn: The laterite pit was operated and maintained for the purpose of supplying fill materials as required. Project is continuous.

(d) 489-5313-0-20, Operations and Maintenance of Quarry, Crusher, and Asphalt Plant of 544th Engineer Company: Produced 23,439 CY of 2"(-) base rock, 1,548 CY of 3/4"(-) asphalt aggregate, and 330 tons of asphalt concrete. Project is continuous.

(e) 451-5301-0-20, Maintenance and Operation of Phu Loi Asphalt Plant, Phu Loi, 34th Engr Bn: Produced 33,584 tons of asphalt this reporting period. Project is continuous.

(f) 489-5315-0-20, Operation and Maintenance of Quarry and Crusher Complex, 46th Engr Bn: Produced 14,330 CY of 2"(-) base rock. Project is continuous.

(g) 417-5303-0-20, Operation and Maintenance of Xom Tam Quarry, 92nd Engr Bn: 53,389 CY of crushed rock and 12,869 tons of asphalt were produced during this period. Project is continuous.

Support Projects

(a) 407-5304-0-20, Additional Cantonment Facilities, 103rd Engineer Company (CS), Resor Quarry, 46th Engr Bn: Work completed during this period included the dismantling and transporting of six SEA huts from Camp Redball to Resor Quarry and providing technical assistance to the 103rd Engineer Company (CS) for the re-erection of the SEA huts, forming and pouring the concrete pad for the buildings, construction of a generator shed, and construction of burnout latrine and field shower. Project is 55% complete.

(b) 417-5301-0-20, Installation of Asphalt Plant at Xom Tam Quarry, 92nd Engr Bn: The plant itself was fully operational by 1 January 1970; a fuel tank facility remains to be installed and a well remains to be drilled. Project is 95% complete.

(c) 451-5302-0-20, Additional Cantonment Facilities for B Co, Phu Loi, 34th Engr Bn: Relocated 13 buildings. Project is 98% complete.

(d) 451-5303-0-20, Fuel Tank and Tower, Phu Loi Asphalt Plant, 34th Engr Bn: Placed concrete pad and erected tower for tank. Project is 90% complete.

(e) 453-5301-0-20, LOC Construction Base Camp at Fire Support Base Lobo, 34th Engr Bn: Constructed berm, fighting bunkers, emplaced wire entanglements, and constructed living bunkers. Project is 60% complete.

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(f) 489-5302-0-20, Base Camp Construction for C Company, 46th Engr Bn: Motor pool, generator shed, maintenance shed, antenna tower and interior roads completed. Project is 95% complete.

(g) 489-5303-0-20, Base Camp Construction for B Company, 169th Engr Bn: Constructed mess hall, water storage, maintenance shop and showers. Project is 92% complete.

(h) 489-5311-0-20, Base Camp Construction of Gia Kiem Base Camp, 544th Engr Co, 169th Engr Bn: Constructed bunkers, mess hall, and showers for the 544th Engineer Company (CS) base camp. Project is 93% complete.

(i) 489-5314-0-20, Site Preparation and Construction of Facilities, C Company, 46th Engr Bn: Rock crusher set-up, explosives magazine, water line, and haul road completed. Overburden is stripped from quarry site. Project is 98.2% complete.

(j) 489-5316-0-20, Base Camp Construction, B Company, 46th Engr Bn: Placed approximately 5000 sandbags on new commo bunker. Installed perimeter lights around compound. Repaired perimeter fence and obstacles. Project is 60% complete.

(5) Material Issue

(a) 717-5301-0-20, Rock Issue to ROK Troops, 46th Engr Bn: 80 cubic yards of rock have been issued. Project is 17% complete.

(b) 743-0303-0-01, Rock Issue to US Army Depot, 46th Engr Bn: 344 cubic yards of 1½"(-) rock and 75 cubic yards of 2"(-) rock were issued this period. Project is 23% complete.

(c) 743-0306-0-01, Construction Materials for Long Binh Power Plant, 46th Engr Bn: Issued 140 cubic yards of sand. Project is 60% complete.

(d) 791-0301-2-20, ARVN Dependent Housing, 46th Engr Bn: Issued plywood, soft lumber, nails, lead, cement and anchor bolts. Project is 60% complete.

(e) 773-5301-0-20, Rock Issue to CMAC, 92nd Engr Bn: 164 CY of 1½"(-) rock was issued during this period. Project is 16% complete.

(6) MACV Advisor Facilities

(a) 807-0303-0-01, MACV Advisory Facilities, Duc Tu, 92nd Engr Bn: A concrete block building is being constructed for advisory living quarters. Project includes waterborne sewage, running water, and electrical facilities. Project is 71% complete.

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(b) 812-0310-0-01, Water Well for MACV Advisors at Trang Bang,
169th Engr Bn: Well drilled to potential water source. Waiting part for
drill. Project is 90% complete.

(c) 889-0304-0-01, III CTZ MACV Advisor Facility, Xuan Loc,
46th Engr Bn: Site layout has been planned for a well, pump/chlorinator shed, 10,500 gallon water with tower, and 400 SF of waterfill hardstand. The 169th Engineer Battalion is providing well-drilling support and has experienced cave-in problems. Project is 0.2% complete.

c. Engineer Plans: During this reporting period the 159th Engineer Group Engineer Section was involved primarily with LOC road construction and quality control. Design of blast wall revetments and design assistance to battalions filled the remainder of the quarter.

(1) The group survey section was committed to LOC road survey on QL-20 and QL-1 the entire reporting period. The section was divided into two teams. One team was attached to the 169th Engineer Battalion to provide centerline and survey control to construction on QL-20; the other team augmented the 46th Engineer Battalion capabilities for centerline and grade control on QL-1.

(2) The group soils section was totally committed to LOC work. In the early part of the reporting period the section augmented battalion capabilities to perform borrow pit analyses such as design CBR, grain size distribution, and Atterberg limits. Testing of daily asphalt samples from the 34th Engineer Battalion's Phu Loi asphalt plant continued during this time.

In early January three additional asphalt plants, two completely new quarry & crusher sites, and two augmented crusher complexes became operational. The group retained responsibility for Marshall stability tests on the asphalt from all four plants, but the gradation, percent asphalt, percent voids, and percent voids filled tests were delegated to the operating battalions. The battalions do not have the capability to run Marshall stability tests. Spot checks of battalion results are made by the group soils section on each plant every three days. Spot checks of sieve analyses of crusher products are also made on a regular basis.

The group soils section monitors and spot checks subbase compaction. In-place soil density and in-place California Bearing Ratio tests are used.

(3) Road construction of the FY 70 LOC program was initiated on 14 November 1969. The final design drawings being prepared by an architect-engineer firm were not available. Fifty percent drawings including horizontal and vertical curves were available. The engineering section designed typical cross-sections for each class roadway to permit initial planning estimates of earth haul, required rock and asphalt production, and equipment allocation.

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(4) Revetments for billet and aircraft protection were designed or modified during the quarter.

(a) The precast reinforced concrete revetments were modified to include four standard heights. The heights were provided by the USARV aviation operations section for aircraft common to RVN. Additional lifting eyes eliminated the cracking experienced in earlier revetments during handling.

(b) A portable revetment for CH-54 Skycranes was designed. The CH-54 parks in an U-shaped revetment; protection on the fourth side was desired. Four by nine foot warehouse carts were used as frames; MBA1 matting on an A-frame of steel angles welded to the cart provides protection while enabling the crew to open the revetment in less than a minute using a wheeled tug to pull the revetment away.

(5) Augmentation to battalion design sections was provided on two occasions. A drainage plan for the 175th Radio Research building at Bien Hoa was completed for the 169th Engr Bn. The section designed and provided construction drawings for the upgrade of a bridge on a three division supply route to class 60.

d. Quarry and Crusher, Asphalt Plant and Concrete Plant Operations

- (1) Total rock crushed - 165,852 CY
- (2) Total asphalt produced - 41,500 tons
- (3) Concrete batch plant production - 2882 CY

e. Training

(1) During the past quarter, the 159th Group expanded its ARVN training program significantly. All four battalions continued to train the first through third echelon of equipment maintenance to ARVN's in a 12 week program known as Project Buddy. On 21 November, 49 ARVN's graduated from the third Project Buddy class at a ceremony held at Group Headquarters. Representatives from ARVN-OCE and MACV attended the ceremony. Currently, 31 ARVN's are training in the fourth cycle. The next graduation is scheduled for 13 February. Four new training programs began during the quarter. The 544th Company (CS), 169th Engr Bn, trained six ARVN's in the construction and operation (OJT) of the Barber-Greene Continuous Asphalt Plant. This training continued for several weeks. The 34th Engineer Battalion organized three new (OJT) courses for ARVN soldiers from the 5th Construction Group, Hoc Mon: the 830 MB scraper (10 received training), the continuous mix asphalt plant (7 received training) and the asphalt paving train (6 received training). The three courses for the 5th Group are continuing into next quarter. The length of the training cycles for each course for the 5th Group has averaged three weeks.

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During the quarter, the dispensing of PX items to ARVN soldiers was made uniform for all battalions. MACV cut orders which authorized sundry packs for the ARVN trainees. CPT Dinh Van Chieu, continued to serve as liaison officer from ARVN-OCE. He helped to monitor training and handle ARVN administrative matters.

(2) The 159th Engineer Group continues to emphasize company level training and weapons familiarization. Weekly classes and range firing are held by units within the group; each man fires his assigned weapon and the crew-served weapons he is likely to man at least once every days. Special emphasis is given to safety and defensive driving due to high monthly mileage driven by the group.

5. Logistics

a. General: Logistics support for units of this Group during the period 1 November 1969 to 31 January 1970 was adequate, but was characterized by shortages of certain construction materials and particular items of equipment.

b. Construction Materials:

(1) Lumber: Sufficient quantities of most sizes of small dimension lumber were virtually unavailable throughout most of the quarter. The nonavailability of certain sizes necessitated the redesign of many projects, occasionally causing delays. It has not been possible to maintain the authorized OSL (Operational Stockage Level) on any critical sizes. Quantities on hand are committed to active projects, and small quantities received periodically through Brigade controlled releases are rapidly consumed.

(2) Bitumen Products: The availability of AP-3 was especially critical during the quarter. The lack of AP-3 necessitated double hauling and caused minor (one week) delays at Black Diamond and Gia Kiem Asphalt Plants. The resupply of AP-3 to our asphalt plant is expected to be a continuing problem during the remainder of the construction period. This unit does not have the haul capability for the approximately 5,000 drums of AP-3 that will arrive per month and must rely on MCC assets for delivery to industrial sites. A one time self-help delivery of 13,500 drums was undertaken in January with considerable difficulty.

(3) CMP: The availability of corrugated metal pipe in the 48", 60", and 72" size remained critical throughout the quarter. Even though some culvert was obtained as excess from another Engineer Group, these large size pieces of culvert remain in short supply. The current shortage could cause delays in the LOC and Tactical Road Programs.

(4) Concertina: The shortage of concertina delayed the up-grading of Long Binh Post perimeter prior to Tet and reduced the effectiveness of the

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Dong Nai Pier Protective System.

c. Critical Items: Limited relief was experienced in obtaining specific command controlled items by aggressive hand carrying of requests through channels.

d. Contract Hauling: Civilian contract trucks were provided to the Group during the quarter for the hauling of RMK-BRJ supplies mineral products to TL2A and an airport at Long Thanh North. Since the initial scope of the construction effort did not include the Long Thanh North Project or the change in design of TL2A, contract haul was utilized.

e. Mineral Products: All of the OICC contracts for RMK-BRJ supplied mineral products are written on an as available basis. Direct coordination between the Group S-4 Section and RMK managers resulted in mutually acceptable solutions to all problems. Since this Group is operating four quarry and crusher sites, this construction season, the dependence on RMK-BRJ supplies mineral products is expected to decrease in the coming quarter. The needed back-up contracts for contractor furnished products will be controlled by Brigade, and the existing group controlled contracts will be eliminated through attrition.

f. Equipment Status: The following list reflects mission essential TOE/MTOE equipment shortages throughout the group:

<u>NOMENCLATURE</u>	<u>AUTH</u>	<u>O/H</u>	<u>SHORT</u>	<u>CHANGE SINCE LAST ORLL</u>
Truck, Dump, 5 Ton (1)	269	213	56	+36
Semi-Trailer, Lowbed, 25 Ton (2)	114	83	31	-6
Semi-Trailer, Wtr, 5,000 Gal (3)	12	0	12	0
Sweeper, Rotary	10	2	8	-4
Distributor, Water	27	17	10	-6
Mixer, Rotary Tiller	4	0	4	-1
Grader, Motorized	36	33	3	-2
Welding Equip Set, #1, 300 AMP	32	20	12	0

(1) The continuing score out and retrograde rate on dump trucks hampers the efforts of the group to arrive at the authorized level.

(2) Of the 83 on hand, 52 lowbeds are in condition code H (eligible for score out). Special arrangements have been made to continue to utilize these 52 lowbeds until replacements are received.

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(3) Indication from USARPAC are that no new 5,000 gallon water tankers will be procured for the theater. USARPAC, G-4, Service's Division, is currently attempting to locate 5,000 gallon fuel (as a substitute) tankers within theater assets.

g. MCA-LOC Equipment Program: The 169th Engineer Battalion continued to pick up, process, and issue the remaining MCA-LOC equipment purchased last year for all 20th Engineer Brigade units. At the close of the reporting period all the items on the original list have arrived in country. A small number of the original items have not been made operational (i.e., 1 hydraulic excavator, 1 transmit mixer, 4 wheeled, utility tractors, and 2, 10 CY dump trucks).

h. RVNAF Improvement and Modernization: During the reporting period the 159th Engineer Group continued its participation in the RVNAF Improvement and Modernization Program (i.e., ARVN Transfer) by preparing selected items of equipment for transfer to the Vietnamese Armed Forces. The 92nd Engineer Battalion at Long Binh is continuing to receive, store, stage, and transfer equipment for 20th Engineer Brigade. ARVN Transfer Number 4 has progressed smoothly. A few pieces of equipment remain to be transferred by 31 March 70.

i. Maintenance:

(1) The four main areas of maintenance interest during the past reporting period were TOE equipment deadline rates, MCA-LOC equipment deadline rates, ASL percent fill, and industrial site repairs.

(a) Deadline rates for selected critical items rose sharply in the early part of the quarter, and then gradually dropped to below 10%. This was due to increased emphasis on maintenance which helped detect more maintenance problems. After detection a concerted effort was made to correct them with a downward trend in the deadline rate. Operator and organizational maintenance, repair parts supply procedures, and decreasing the zero balance in the ASL's were the three main areas attacked in improving maintenance.

(b) ASL zero balances rose from 40 percent to above 50 percent. This was due to the addition of approximately 1800 lines for rock crushers and asphalt plants. These lines were added under a special program set up by USARV Supply and Maintenance Section to insure continued operation of all industrial sites. At the end of the quarter ASL's were showing a downward trend. Emphasis has been placed on using Red Ball Expanded (RBX) requisitions in ordering up to 25% of authorized requisitioning objectives on deadlining critical parts.

(c) The MCA/LOC equipment has experienced an increasing deadline rate throughout the quarter. It has risen from 10.4 percent to 16.9 percent. Failure in the resupply of parts, particularly for the GMC 10 CY dump trucks, was the principal contributing factor to this rise in deadline.

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Contractor maintenance teams have varied from excellent to poor. Qualified lead foremen seem to be the key in having a responsive maintenance system.

(d) Industrial sites became the most critical maintenance area during the past quarter. Low density items such as rock crushers and asphalt plants became the most closely observed areas by maintenance personnel. Completion of the group's mission is dependent on the continuous operation of these sites. Repair parts for these items have been in short supply, and the supply system has not been fast enough in responding. Assistance from civilian technicians has been of great value at these sites, in both design and maintenance.

(2) TOE Equipment

(a) Cracks developed in the steering arms of 10 ton tractors used in this group. Continued vigilance is necessary to correct trucks with these problems. Welding of these arms was attempted with mixed results. The only sure solution was replacement of the parts.

(b) Alternators on the Allis Chalmers model 645 M Scoop loaders were a problem during this quarter. The alternator is not common to any other piece of equipment in the Army, and has been in extremely short supply.

(c) Tires and tubes for 5 ton dump trucks have been one of the most serious problems we have experienced, and continue to be a problem. Work around quarries increases the number of tire failures. Some methods used to alleviate this problem include: obtaining releases for excess ARVN 5 ton tires, local purchase of tires on contracts with civilian agencies, and salvage of tires and tubes from retrograde equipment.

(d) Frames on 5 ton dump trucks have cracked in some instances. This has not been a major problem, but an experiment was performed on strengthening the frames with $2\frac{1}{2}$ ton cross-members. While the experiment was successful, the length of time required to modify the truck was high.

(e) Steering clutches on Barber Greene asphalt pavers have been a problem. These clutches are manually operated, and tend to slip while in operation. During the first two weeks of the construction season 2 pavers were deadlined with this problem. All units have ordered spare clutches for these pavers.

(f) The 25 ton semi-trailers have had a high number of cracked frames. The cracks appear along welds above the goose neck, and have been corrected by welding with mixed results.

(g) Wheeled tractors (Clark model 290 M's) have had a great deal of problems with torque convertors. Much of the problem can be attributed to operator carelessness. Operators travel at high speeds, and

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then down shift without braking. This causes the torque convertors to fail.

(3) MCA/LOC Equipment

(a) In discussing the MCA/LOC program, three main areas must be investigated. These consist of personnel, equipment, and repair parts.

((1)) Personnel

Most units are pleased with the Dynaelectron personnel that are assigned to them at the present time. The exception to this is the 43rd Dump Truck Company. The lead foreman has been changed 3 times in the last quarter. Some personnel working on the night shift have come to work intoxicated, some have signed in and then left, and some just fail to come at all. Dynaelectron has fired some individuals, and the situation seems to be improving.

At the beginning of the quarter, the 104th Engineer Company (DT), and the 43rd Engineer Company (DT) shared maintenance facilities and maintenance personnel. This situation has also been changed. Each unit now has a team of its own, and facilities of its own. This has given the Company Commanders involved a more responsive maintenance team. Army supervisors can determine problem areas much more readily under this system.

Maintenance personnel hired by Dynaelectron are supposed to be good mechanics trained to maintain and repair the specialized MCA/LOC equipment. In fact, they are in some areas, no better trained than their Army counterparts. This is one of the biggest problems in the MCA/LOC program.

In summary the personnel assigned to some units have not been satisfactory. The methods used to correct this include the following: replacement of personnel, insuring a 1 to 1 ratio of supporting teams to units, giving separate facilities to each supporting team, and bringing to the attention of Dynaelectron, all personnel who do not meet required standards.

((2)) Equipment

The biggest problem with equipment has been with the GMC 12 CY dump trucks. Several problems with the equipment have been noted. Some are listed below:

((a)) The intake for the air cleaner is located in the lower front of the engine compartment beside the wheel well. The intake faces straight down, and when the truck is idling on a dusty road, the engine exhaust blows dust directly into the intake.

((b)) The gas tank is not mounted securely. Some tanks have fallen off, and others have been forced forward in their brackets.

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((c)) Bolts used in the engine mounts continue to fail.

((d)) Water collection bowls break, and by-pass tubes have to be fabricated.

((e)) The only other piece of equipment that has a noticeable defect is the 5000 gal asphalt distributor. The pump on this distributor is not reliable, and continues to break down.

((3)) Repair Parts

Repair parts is one of the biggest problems in the MCA/LOC program. Some equipment has never run because parts to repair it have not come through the supply system. Supply of repair parts is spotty. Some items come rapidly, while others fail to arrive. There is no apparent reason for this inconsistency.

It is extremely difficult for army representatives to obtain accurate status on requisitions. During the quarter, two separate methods of recording were used. One method consisted of ordering through Dynaelectron, and the other through Army channels. At the present time a modification of the two systems is in use. Dynaelectron orders all parts on deadlined equipment, and the Army orders for all items to be put in stock. This system has not been in effect long enough to judge whether or not it will be satisfactory.

(4) Industrial Sites

During the quarter, the group opened or continued to operate four (4) quarries, and four (4) asphalt plants. Resor and Black Diamond quarries had been in operation for some time. Banana Quarry and Gia Ray Quarry were added. Asphalt plants were set up at Phu Loi, Resor, Black Diamond, and Banana quarry. These four rock crushing systems, and the four asphalt plants have become the most critical pieces of equipment in the group.

It has become important to have at least one back up engine for each engine on the crushers and on the asphalt plants. These engines should be complete packages from the radiator to the power take off and should be used while repairs are being made to the primary power unit. Engines are presently on order under Project IMG.

The use of experienced civilian contractor personnel has been of great help in analyzing equipment problems.

Repair parts for low density items continues to be a major problem. Some relief has been found through purchasing parts from RMK-BRJ. The only way to be sure of continued operation is a one for one back up of engines and other major components.

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6. Force Development: The 159th Engineer Group and subordinate battalion AOR's remained unchanged from the previous quarter reflecting the major road construction mission of each unit for the next six months. The 34th Engineer Battalion remained at Phu Loi and operated the Phu Loi asphalt plant with organic personnel. The asphalt platoon of the 103rd Engr Co (CS) returned from Phu Loi to company control; the 103rd Engr Co (CS), attached to the 46th Engr Bn, operates the quarry, crusher, and asphalt plant at Resor Quarry. Company C of the 46th Engineer Battalion operates a quarry and crusher at Gia Ray (YT 6313). Company C of 92nd Engineer Battalion with the attached 515th Asphalt Platoon operates Black Diamond (formerly Xom Tam) quarry, crusher, and asphalt plant. The 544th Engineer Company (CS), attached to the 169th Engineer Battalion, was augmented with two light equipment company quarry sections from the 557th & 595th Engr Companies (LE) to establish and operate a large quarry, crusher complex, and asphalt plant at Banana Quarry (YT 3516). The total of four quarry-crusher complexes and four KA-60 hot mix asphalt plants provides a large capability for road construction.

7. Command Management

a. Within the 159th Engineer Group great effort is still being expended to insure the effective flow of communications and efficient planning and scheduling techniques. Weekly scheduling conferences are attended by the Group CO, his staff, Battalion CO's and appropriate battalion staff members. Scheduling priorities and efficient utilization of available engineer effort are coordinated and problems resolved.

b. Major emphasis was given to completing and instituting a comprehensive accounting and construction reporting program which gives continuous automatic review of construction costs and provides accurate costing information for proper completion of project data requests. Procedures have been set up to monitor and report all of the production of the group construction support operations as well as contractor supporting operations and to insure that after continuous and complex intra-group allocations of resources, the materials, manhours, and production figures are reported accurately to the correct project.

c. The 159th Engineer Group leads all other Engineer Groups in Vietnam in the processing of completion report backlogs. During the quarter Group Headquarters virtually completed the final phase in closing out the backlog of completion reports due for old projects. For the first time since 1966, there are no files unreconciled for projects that are completed or terminated.

d. With over two thirds of the group effort devoted to LOC construction a separate LOC section within the operations section has been formed under one officer. He coordinates planning and forecasting of requirements for future construction, monitors the progress on current road construction, and

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establishes minimum production goals and product allocation for the industrial sites. Administrative support to the LOC section is provided by the engineering, construction management, and administrative sections.

8. INSPECTOR GENERAL ACTIVITIES

a. The 92nd and 169th Engineer Battalions received satisfactory ratings from inspections held during the quarter.

b. Acting Inspectors General continue to receive and process complaints and requests for assistance at battalion and group levels.

9. PIO:

a. During the past quarter, the Group Information Office continued to emphasize the need for timely reporting of newsworthy events. The past quarter was highlighted by a Group Information Conference on 13 November to inform new information specialists and photographers of group policies, to pinpoint recurring errors, discuss problems, and to discuss techniques for good journalism. In addition to representatives from subordinate battalions, the Brigade and Engineer Troops Information Officers attended.

b. The Group Byline, published bi-weekly, provided guidance to battalions for increased quality journalistic output and indicated the extent to which each battalion has participated in the information program. The major news categories for articles submitted were Vietnamization, ARVN training, civic action projects, newly constructed plants and quarries, and unique engineering efforts.

c. The photographic program expanded in scope during this past quarter. Continuous coordination between the IO and photographer was stressed to increase the comprehensive coverage of a news event. Distribution of black and white and color film by Group augmented battalion supplies. The demand for current color slides increased this past quarter. Color slides of important projects were taken for weekly update briefings at 20th Engineer Brigade and for briefings of visitors at Group Headquarters. During the quarter, 20th Engineer Brigade established the requirement for Group to furnish 15 slides per month. Slides included significant operational support and major group construction efforts. Significant slides of the group's activities were catalogued and filed by the Group Information Office. The slide file serves as a photographic history of major group projects.

d. 88 stories were submitted to Group this past quarter from Battalions. Twenty-five stories were published in outside media which included Castle Courier, Army Reporter, MAC Observer, Army Times, and Stars and Stripes. Total column inches published for this quarter was 528.5.

e. The Home Town News Release Program was given increased emphasis. During the past quarter, 1166 HTNRs were forwarded. This is an increase from the previous quarter.

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f. Outside media were utilized to publicize the Group's activities during the past quarter. A radio feed supplied to II Field Force Vietnam IO which concerned the graduation of the third Project Buddy class was broadcast on AFVN Radio "III Corps Round-Up" program. AFVN-TV carried a story which concerned the dedication of the Vien Giac Orphanage, a civic action project of the 100th Engineer Company (FB).

10. CIVIC ACTION

a. The Group civic action program continued the policy of close coordination with MACV and CORDS for civic action projects not originating from advisor units. Advisory teams were asked to accompany their requests for materials with letters stating the scope of the project. Emphasis was placed upon self-help projects; Vietnamese would receive needed materials and construct the project themselves with a minimum of supervision. Materials for civic action projects continued to be scarce, but concerted efforts were made to utilize scrap materials when they became available.

b. The past quarter was highlighted by several successful Thanksgiving and Christmas parties given by units within the Group. Clothes were distributed to the Vietnamese at that time.

c. Whenever possible, news articles with photographs publicized civic action efforts within the Group. Articles about the Group's civic action projects appeared in the Castle Courier, Army Reporter, MACV Observer, the Stars and Stripes, and on AFVN-TV. The Group's Tactical Road Program, an effort to increase the mobility of the Vietnamese people in outlying areas through the upgrading of light-duty roads, continued to be publicized. Battalion civic action projects were monitored by Group; battalions submitted monthly civic action reports to Group for review, consolidation, and submission to 20th Engineer Brigade.

d. The following are highlights of civic action projects for this period:

(1) The 34th Engineer Battalion participated in two major civic action projects. A MEDCAP program was successfully spearheaded by the battalion surgeon at the Phu Cuong Hospital. A total of 565 MEDCAPS were conducted by the 34th this past quarter. The 34th has continued its program of assistance to the Trong Cong Giao School for the Deaf; reading and writing materials were provided.

(2) The 159th Engr Group supported Advisory Team 87 in Xuan Loc by supplying materials for the construction of an extension to an existing medical ward for the 18th ARVN Medical Battalion; construction was accomplished by self-help. The improvement of the existing medical medical ward benefitted the ARVN dependents. Approximately 30 infants are born at the hospital each month; enlarged hospital space and improved facilities open the way for greater prenatal, delivery, and post-partum care.

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(3) The 46th Engineer Battalion continued its support of the construction of the maternity hospital at Di An. Ninety-five percent of the project has been completed. Work slowed because of the delay in securing needed plumbing fixtures. The hospital is being built jointly with the 5th RVN Marine Battalion.

(4) Through the efforts of Bravo Company, a 40 foot section of 36" culvert was used as well casing for the Bien Ho Orphanage. This new well will provide a year round supply of water for the orphanage which had previously been plagued by a shortage of water.

e. Commodities distributed for Civic Action:

- (1) Cement - 400 pounds
- (2) Tin sheets - 16
- (3) Lumber - 300 pounds; 23 loads of scrap lumber (5-ton truck)
- (4) Wire - 3 spools (250' each spool)
- (5) Rock - 90 cubic yards
- (6) Gravel and sand - 11 cubic yards
- (7) Culvert - 36 feet
- (8) Pipe - 180 feet
- (9) Fixtures, Light, Fluorescent - 8, each 48" lights
- (10) Food - 370 pounds
- (11) Clothing - 1760 pounds
- (12) Health Items - 20 pounds
- (13) MEDCAPS - 2496

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SECTION II: Lessons Learned: Commander's Observations, Evaluations and Recommendations.

1. Personnel: None

2. Intelligence:

a. Perimeter Lighting

(1) Observation: Security is improved and guard fatigue is reduced by lighting the perimeter wire.

(2) Evaluation: Perimeter guards at large, fixed, rear area installations in the RVN such as Long Binh Post are not knowledgeable in how to interpret shadows and noises at night. The perimeter guards at these installations are normally headquarters or support troop personnel without significant exposure to night operations. The resultant fear of the unknown leads to overreaction to suspected enemy probes in the defensive wire and to undersurveillance of actual routes of advance by sappers. The addition of lights along the perimeter eliminates reaction to normal night sounds and assists inexperienced guards by lighting all possible approaches.

(3) Recommendation: Perimeters of large, fixed installations in the RVN be lighted.

b. Clearing vegetation from perimeter wire.

(1) Observation: Concertina and barbed wire defensive works lose strength and resiliency when burned and must be replaced.

(2) Evaluation: The accepted method of clearing brush and grass from defensive wire is burning. Beside the danger from munitions such as trip flares or claymore mines not being removed, the heat from fire destroys the effectiveness of the wire. Concertina and barbed wire becomes brittle. Large sections of perimeter wire must be replaced to remain effective.

(3) Recommendation: Means other than burning such as defoliation be used to remove vegetation from perimeter wire.

3. Operations:

a. LOC section within the operations section.

(1) Observation: Management of a major program such as LOC road upgrade requires assignment of an officer specifically to that program.

(2) Evaluation: The 159th Engineer Group has committed two thirds of its construction effort to LOC upgrade for FY 70. With four

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crushers and quarries, four asphalt plants, over 140 kilometers of road, and three battalions engaged in the LOC effort close continuous monitoring of the program is a necessity. To meet this management requirement the operations section has organized a separate section to be the action office on all LOC matters. This section is headed by a captain who reports directly to the operations officer; with guidance from the operations officer he establishes priorities of effort, measures progress of construction to date, monitors the activity of the industrial sites supporting the LOC program, allocates industrial site products and construction equipment within the LOC program, and coordinates with the maintenance staff to expedite repair of deadlined critical equipment. The establishment of a separate section with one principal program focuses all the available program-related data in one location and facilitates responsive decisions and coordinated group staff effort.

(3) Recommendation: A separate action office should be established for programs of major impact upon group operations.

b. Lead time for LOC program planning.

(1) Observation: Decisions directly influencing the plans for quarry establishment and road upgrade were not made until September 1969. The start of the construction season in III CTZ is 1 November when rains have abated.

(2) Evaluation: Mobilization time to establish a virgin quarry, move a construction support company, prepare a base camp, and set up a crusher complex and asphalt plant is approximately three months. To this must be added time to program reallocations of engineer troop effort, obtain land use concurrences from the GVN, and plan the quarry layout; this took an additional two months. Banana Quarry, the key to the FY 70 LOC program in the 159th Engineer Group did not become fully operational until late January, three months into the eight month construction season. This late start significantly affected the required production and construction rates required to complete the FY 70 program this dry season.

(3) Recommendation: Decisions establishing industrial sites should be final five to six months in advance of the required production.

c. Lead time for architect-engineer plans

(1) Observation: Final architect-engineer plans should be provided a troop construction unit prior to the start of construction to minimize effect of changes.

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(2) Evaluation: The 159th Engineer Group began upgrade of three LOC roads in the RVN on 14 November 1969. At that time only 50 percent drawings were available. The construction start was dictated by back planning from the required completion date of 31 July 70 for 143 kilometers of road. The 50 percent drawings included horizontal alignment and vertical curves; the group designed typical cross sections based on CENCOM standards, preliminary soils investigation, and Asphalt Institute methods of design. These cross sections were used to start construction and estimate required quantities of materials. Changes in plans as A-E design progressed required changes in alignment, complete change in road cross section adding six inches of rock to the base, and changes in culvert location. Each change required rescheduling and reallocation of equipment and mineral resources. Final plans were not received for all roads until 31 January 1970.

(3) Recommendation: Where contractors provide project designs, these designs should be furnished the constructing unit prior to the start of construction.

d. Industrial site incentives

(1) Observation: The quarry, crusher, and asphalt plant operators at industrial sites require short range incentives to maintain production.

(2) Evaluation: The vested interest of an operator at an industrial site is not great. Normally he is not motivated by career goals in the service or requirements to complete a project on time. He does respond to personal recognition of tangible rewards on a short term basis. Attainable goals established for short periods with immediate reward for goal achievement produce the most marked results. The tedium of continuous production without recognition is broken by rewards such as time off. Goals are established IAW required production and machinery capabilities. Rock production at the four quarries within the 159th Engineer Group has noticeably improved with the establishment of such a system. In some cases weekly production figures have doubled.

(3) Recommendation: Short term incentives such as time off, awards, etc. be used at industrial site operations where the results of accomplishment are easily measurable but not otherwise meaningful to the operators.

e. Surge piles

(1) Observation: Surge piles of rock permit more flexibility and greater overall productive time of rock crushers at a quarry-crusher site.

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(2) Evaluation: In the establishment of Banana Quarry a surge pile was programmed between the primary and secondary crushing unit. This arrangement permitted the primary jaws to continue to break down blast rock during adjustment or unscheduled maintenance of the secondary units; obviously the secondary can be producing when the primary crushers are inoperative by feeding from the stockpile. An additional advantage is that one part of the plant can crush at night with a reduced crew to maintain secondary output equal to the total output of the primary.

(3) Recommendation: Military crushers should be positioned to permit the maximum number of surge piles between major components of the crusher. Sufficient conveyors and tunnel feed hoppers should be made part of the crushing set to permit at least one surge pile.

f. Industrial Site Product Allocation

(1) Observation: The products of troop operated industrial sites, i.e. rock and hot mix asphalt, must be allocated by the headquarters commanding all similar sites in a geographically close area.

(2) Evaluation: The 159th Engineer Group controls four quarries and crushers and four hot mix asphalt plants. These industrial sites are operated by the four battalions in the group; each site has a primary project to support. The products produced are similar, base rock, asphalt aggregate, and asphaltic concrete. The changing daily requirements of each project and the variable daily output of each plant due to unscheduled maintenance would result in numerous mismatches between production and requirements. To counter the possibility of mismatches the group operations section manages the allocation of asphalt products on a daily basis and the allocation of rock products on an exception basis. The difference in level of control is based on the inability to stockpile hot mix asphalt. Asphalt must be programmed without error for maximum production while rock can be stockpiled without production loss.

(3) Recommendations:

(a) Industrial site products should be allocated by the headquarters commanding similar sites in a geographically close area.

(b) Asphaltic concrete must be managed very closely to insure maximum production.

(c) Rock can be managed on an exception criteria basis.

4. Organization: None

5. Training: None

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6. Logistics:

a. Supply of major end items.

(1) Observation: There are excessive shortages of major engineer equipment end items throughout this group.

(2) Evaluation: The age of engineer construction equipment issued to troops, and the continuous rugged operating conditions under which this equipment is used, have resulted in the necessity to score out equipment at a faster rate in some cases than the supply system has been able to respond with replacement items. A contributing factor has been the directed turnover of equipment to the RVNAF. The equipment most critical in this regard is listed each month on the Commander's Critical Items List, and includes such items as dump trucks (currently short 56 of 269 authorized); 25-ton lowbed semi-trailers (currently short 31 of 114 authorized); sweeper rotary (currently short 8 of 10 authorized); grader motorized (currently short 3 of 36 authorized); water distributor, 1,000 gallon (currently short 10 of 27 authorized); semi-trailer, tank water, 5,000 gallon (currently short 12 of 12 authorized); welding equipment set #1 (currently short 12 of 32 authorized). Considering the missions now assigned to this Group, and particularly the LOC construction mission, such major shortages are a matter of major concern.

(3) Recommendation: Analyze the Army distribution and procurement policies pertaining to engineer equipment in order to allocate sufficient assets to USARV to preclude significant end item shortages.

d. Liaison with RMK-BRJ

(1) Observation: The 159th Engineer Group has developed an excellent working relationship with the contractor in the areas of quarry operations, furnishing of contractor excess materials, and scheduling delivery of contractor furnished products.

(2) Evaluation: Cooperation by the contractor in assisting this Group in the accomplishment of its assigned missions had contributed to unit efficiency in many ways on numerous occasions.

(3) Recommendations: That all Engineer Groups maintain a cordial relationship with RMK and other civilian contractors, providing liaison officers to deal with these agencies on a personal basis whenever possible.

c. Losses and Delays during Shipment:

(1) Observation: It has become evident that critical items of supply (especially Class IV) which are shipped from one point to another within country (to include shipments between depots) often do not reach their destinations or arrive in quantities less than were shipped.

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(3) Recommendation: That all shipments from Qui Nhon or Cam Ranh Bay depots be held to those absolutely necessary. That the Brigade MRE at Cam Ranh Bay be used both to expedite shipment, and to monitor loading and departures.

7. COMMUNICATIONS:

a. Equipment Authorization

(1) Observation: The communications requirements of the Engineer Construction units participating in the LOC program exceed the capabilities of organic communications equipment.

(2) Evaluation: This Group has three Engineer Construction Battalions participating in the LOC program. Two of these battalions have established Base Camps on or near the work sites and must rely solely on radio communications for command and control, base camp security and security on the job sites. Because of the low-density of FM radio sets, the proper communications net work cannot be established.

(3) Recommendation: That Engineer Construction Battalions participating in the LOC program be authorized to tailor the TOE/MTOE authorizations for signal equipment to meet mission requirements.

8. MATERIALS: None.

9. Other: None.



J. K. BRATTON
COL, CE
Commanding

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AVBI-OS (14 Feb 70) 1st Ind

SUBJECT: Operational Report of 159th Engineer Group for the Period
Ending 31 January 1970, RCS CSFOR-65 (R2)

DA, Headquarters, 20th Engineer Brigade, APO 96491

10 MAR 1970

TO: Commanding General, United States Army Vietnam, ATTN: AVHGC- DST,
APO 96375

Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D.C. 20310

1. Submitted in accordance with USARV Regulation 525-15, dated 13 April
1968.

2. This headquarters concurs with the submitted report with the following
comments:

a. Section II, paragraph 3b, page 35: Planning for the 1971 LOC
Program has commenced considerably earlier than that for the 1970 program.
It is anticipated that decisions establishing industrial site locations
will be finalized five to six months in advance of the required production.

b. Section II, paragraph 3f, page 37: Although the 159th Engineer
Group does allocate industrial site products for their own projects, the
guidance to and requirements of the 79th Engineer Group must be provided
by the Brigade headquarters which has overall management responsibility.

c. Section II, paragraph 6a, page 38: The 159th Engineer Group
now has fill on both dump trucks and graders.

d. Section II, paragraph 7, page 39: Recommend that Group assets be
redistributed during the LOC construction season or that a request for
temporary loan from depot stock be submitted.

FOR THE COMMANDER:

Fn *Kennerl J. Welke 14 C-2*
H. V. GOSWEILER III
1LT, CE
Assistant Adjutant

Copy Furnished:
CO, 159th Engr Gp

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AVHGC-DST (14 Feb 70) 2d Ind

SUBJECT: Operational Report-Lessons Learned (Headquarters, 159th Engineer Group) Period Ending 31 January 1970 RCS CSFOR-65 (R2)

Headquarters, United States Army, Vietnam, APO San Francisco 96375 1 APR 1970

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 January 1970 from Headquarters, 159th Engineer Group and concurs with the comments of indorsing headquarters.

2. Comments follow:

a. Reference item concerning "Construction Material", page 24, paragraph 5b(2) - (4): concur. There is a command-wide shortage of these construction materials. Strict command control procedures are used to insure efficient use of available assets. Intensive management procedures must continue in effect until the overall supply situation improves.

b. Reference item concerning "MCA/LOC Repair Parts", page 29, paragraph 51 (3) (a) ((3)): nonconcur. It is recognized that supply of repair parts is an important element in the maintenance of this construction equipment, as it is with standard Army material. Supply of repair parts by the contractor is provided for in the contract. Budget limitations in the early phase of the contract required a deviation from this procedure; repair parts for stockage (ASL) have been ordered through USAMECOM, as well as some emergency repair parts. Currently, the repair parts supply procedure provides for the contractor to furnish all repair parts, purchasing those items which are not available locally in the military supply system. Results of this procedure compare very favorably with the alternative of using the military supply system for providing repair parts for non-standard equipment in troop units.

c. Reference item concerning "Lead Time for Architect-Engineer Plans", page 35, paragraph c(1): concur. While it is desirable to have final designs before starting construction, work can begin without them. The constructing units receive 20%, 50%, and 90% drawings for review and comment prior to receiving the final designs, and these intermediate drawings serve as a basis for construction planning. The 20% (preliminary) drawings show the general alignment of the proposed road. The 50% drawings included the initial plan and profiles sheets from which approximate earth quantities can be determined. The 90% drawings include nearly all the information which would influence construction planning scheduling. Design time for a 20Km section road takes about 40 to 50 working days on the average and review of the drawings at each intermediate stage (20,50,90%) takes 30 to 40 days. During these reviews the brigades must field check

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1 APR 1970

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the design and submit their comments through this headquarters to OICC. Major changes must be submitted to MACV for approval. Total design and review time approximates 170 working days. This interval is difficult to compress and still produce quality engineering work.

d. Reference item concerning "Supply of Major End Items", page 38, paragraph 6a: concur. The USARV Engineer Command in coordination with USARV G-4 and USAICCV is aware of this problem and is continually studying the distribution and procurement policies. CONUS NICP's have also been made aware of this problem.

FOR THE COMMANDER:

Cy furn:
20th Engr Bde
159th Engr Gp

C. E. Michels
C. E. MICHELS
MAJ, AGC
Assistant Adjutant General

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GPOP-DT (14 Feb 70) 3d Ind

SUBJECT: Operational Report of HQ, 159th Engineer Group for Period
Ending 31 January 1970, RCS CSFOR-65 (R2)

HQ, US Army, Pacific, APO San Francisco 96558 12 MAY 1970

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D. C. 20310

1. This headquarters concurs in subject report as indorsed.
2. Attached as Inclosure 1 is a copy of the letter, this headquarters,
which furnished recommendations and comments to CGUSARV on points raised
in paragraph 5i(2), page 27, (a) through (g).

FOR THE COMMANDER IN CHIEF:

~~+ Incl~~
as
Incl wd HQ, DA (Illegible)

L. M. OZAKI
CPT, AGC
Asst AG

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Security Classification

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1. ORIGINATING ACTIVITY (Corporate author)		2a. REPORT SECURITY CLASSIFICATION FOR OFFICIAL USE ONLY
HQ, OACSFOR, DA, Washington, D.C. 20310		2b. GROUP PROTECTIVE MARKING IS EXCLUDED FROM AUTOMATIC TERMINATION
3. REPORT TITLE Operational Report - Lessons Learned, HQ, 159th Engineer Group		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Experiences of unit engaged in counterinsurgency operations, 1 Nov 69 to 31 Jan 70.		
5. AUTHOR(S) (First name, middle initial, last name) CO, 159th Engineer Group		
6. REPORT DATE 14 February 1970	7a. TOTAL NO. OF PAGES 46	7b. NO. OF REFS
8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER (S) 701194	
8b. PROJECT NO. N/A	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
10. DISTRIBUTION STATEMENT		
11. SUPPLEMENTARY NOTES N/A	12. SPONSORING MILITARY ACTIVITY OACSFOR, DA, Washington, D.C. 20310	
13. ABSTRACT		